PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
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M. J. McCORMICK, Jr., P.E.
PLANT MANAGER
LIMERICK GENERATING STATION

November 15, 1989

Docket No. 50-352
License No. NPF-39

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER reports a Refuel Floor Secondary Containment isolation and Standby Gas Treatment System initiation, Engineered Safety Features, due to low negative differential pressure as a result of an apparent design deficiency.

Reference:	Docket No. 50-352
Report Number:	1-89-010
Revision Number:	01
Event Date:	February 4, 1989
Report Date:	November 15, 1989
Facility:	Limerick Generating Station P.O. Box A, Sanatoga, PA 19464

This revised LER is being submitted to provide the results of an investigation into the feasibility of increasing the time delay on the Refuel Floor Ventilation system isolation on low differential pressure, and a review of the apparent system interaction and appropriate corrective measures. The original LER was submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv). Changes are identified by a vertical bar in the right hand margin.

Very truly yours,

M. J. McCormick, Jr.
Plant Manager

DCS:sc

cc: W. T. Russell, Administrator, Region I, USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS 1

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1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Limerick Generating Station, Unit 1	0 5 0 0 0 3 5 2	1 OF 0 5

TITLE (4) Refuel Floor Secondary Containment Isolation Due to Low Negative Differential Pressure as a Result of an Apparent Design Deficiency

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 2	0 4	8 9	8 9	0 1 0	0 1	1 1	1 5	8 9		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
C. R. Endriss, Regulatory Engineer	AREA CODE 2 1 5 — 3 2 7 - 1 2 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On February 4, 1989, at 1818 hours, isolation of the Refuel Floor (RF) Secondary Containment and initiation of the Standby Gas Treatment System (SGTS), Engineered Safety Features (ESF), occurred on low negative differential pressure between the RF Secondary Containment and the outside environment. A Reactor Enclosure (RE) supply duct high temperature condition signal caused isolation of steam to the RF Ventilation supply fan heating coils. The RF Ventilation supply fans tripped on low temperature and the RF Ventilation exhaust fans continued to operate until the RF differential pressure reached the exhaust fan trip setpoint. With the normal supply and exhaust fans off, the RF differential pressure decayed to greater than negative 0.1 inches H_2O. The RF Secondary Containment and SGTS then operated as designed to restore acceptable negative differential pressure between the RF Secondary Containment and outside environment. SGTS was secured and RF Ventilation placed in reset to allow troubleshooting. The steam supply to the RF and RE Ventilation supply fan room isolation valve was bypassed and a Temporary Circuit Alteration (TCA) was installed to bypass the low temperature trip of the RF Ventilation supply fans. The RF Secondary Containment isolation was reset and the normal RF Ventilation system returned to service. There were no adverse consequences and no radioactive material was released as a result of this event.

Unit Conditions Prior to the Event:

Operating Mode: 5 (Refuel Outage)

Reactor Power: 0%

Description of the Event:

On February 4, 1989, at 1818 hours, isolation of the Refuel Floor (RF) Secondary Containment (EIIS:JM) and initiation of the Standby Gas Treatment System (SGTS) (EIIS:BH), Engineered Safety Features (ESF), occurred on low negative differential pressure between the RF Secondary Containment and the outside environment. The RF Secondary Containment and SGTS operated as designed to restore acceptable negative differential pressure between the RF Secondary Containment and outside environment.

Prior to the event, on February 4, 1989, at 1440 hours, RF Secondary Containment integrity was established, with the normal RF ventilation supply and exhaust fans running, in preparation for performing core alterations. Normal Reactor Enclosure (RE) Ventilation (EIIS:VA) was shutdown for testing with RE Secondary Containment integrity not required during refueling activities. At approximately 1813 hours, a local panel (EIIS:PL) trouble alarm (EIIS:ALM), for panel 10C206, "Reactor Enclosure Supply and Refueling Area Ventilation Control Panel", annunciated in the Main Control Room (MCR). The annunciator was acknowledged and a plant operator was dispatched to investigate the cause. At 1816 hours the same annunciation recurred. At 1816 hours an annunciation in the MCR indicated RF low negative differential pressure. Following the designed 100-second time delay (EIIS:2), at 1818 hours, the RF Secondary Containment isolated and both trains of SGTS initiated before any action could be taken.

Proper isolation of RF Secondary Containment was verified by operations in accordance with system procedure S76.9.A, "Verification of Reactor Enclosure or Refueling Floor Secondary Containment Isolation". The 'A' SGTS train operated to maintain acceptable negative differential pressure between the RF Secondary Containment and outside environment and the 'B' SGTS fan was placed in standby. Since no core alterations, movement of irradiated fuel or activities with the potential for draining the vessel were planned or being performed, RF Secondary Containment integrity was not required at the time of the isolation. At 1931 hours SGTS was secured and RF Ventilation (EIIS:VG) placed in reset to allow troubleshooting. The SGTS was in service for a total of 1 hour and 13 minutes. Following an investigation of the cause of the event and immediate corrective actions, on February 5, 1989, at 0515 hours the RF Secondary Containment isolation was reset and RF normal ventilation

returned to service. A four (4) hour notification to the NRC was made on February 4, 1989 at 2150 hours in accordance with the requirements of 10CFR50.72(b)(2)(ii), since this event resulted in the automatic actuation of an ESF.

Consequences of the Event:

There were no adverse consequences and no radioactive material was released to the environment as a result of this event. RF Secondary Containment isolation systems and SGTS responded as designed following a low negative differential pressure signal. Since there were no core alterations, movement of irradiated fuel or operations with a potential for draining the reactor vessel during this event, RF Secondary Containment integrity was not required. If a single train of SGTS had failed, the redundant train would have been capable of performing its intended safety function of maintaining RF Secondary Containment integrity. If a failure had occurred in either RF Secondary Containment isolation channel, the redundant channel would have been unaffected thereby ensuring proper isolation of the RF Secondary Containment.

Cause of the Event:

The cause of this event is an apparent design deficiency in the RE Ventilation system, which permits system interaction with the RF Ventilation system. After investigation it was determined that a RE supply duct high temperature condition occurred when steam to the RE supply fan heating coils (EIIS:FCU) was not manually reduced following removal of the RE Ventilation system from service. With the RE Ventilation system out of service, steam supplied to the heating coils and the supply fans (EIIS:FAN) not running, the supply air high temperature trip setpoint of 90° F. was reached. This high temperature signal correctly caused the steam isolation valve, TV-96-102, to close, isolating steam to the RE Ventilation supply fan heating coils and the RF Ventilation supply fan heating coils. This steam supply isolation was annunciated on the fan room local control panel and resulted in the first local panel trouble alarm to be annunciated at 1813 hours in the MCR.

With the RF Ventilation supply fans running and the steam supply isolated to the heating coils, the RF Ventilation supply fans tripped on low temperature, 35° F., as sensed by TSL-76-115 (EIIS:TT). This trip annunciated on the fan room local control panel and resulted in the second local panel trouble alarm to be annunciated at 1816 hours in the MCR. The RF Ventilation exhaust fans continued to operate until the RF differential pressure reached the exhaust fan trip setpoint of negative 2.7 inches H_2O. With the normal supply and exhaust

fans off, the RF differential pressure decayed to greater than negative 0.1 inches H_2O. After a designed 100-second time delay, with negative differential pressure less than 0.1 inches H_2O, RF Secondary Containment isolated and SGTS initiated as designed and returned the RF to the required negative differential pressure.

Corrective Actions:

Upon receipt of the MCR alarms, a plant operator was dispatched to investigate the cause. The RF Secondary Containment isolation occurred before action could be implemented. The MCR operators verified proper isolation and initiation of SGTS in accordance with procedure S76.9.A, "Verification of Reactor Enclosure or Refueling Floor Secondary Containment Isolation." Since the RF Secondary Containment integrity was not required, the RF Ventilation system was reset to allow troubleshooting. The steam supply to the RF and RE Ventilation supply fan room isolation valve, TV-96-102, was bypassed and a Temporary Circuit Alteration (TCA) was installed to bypass the low temperature trip of the RF Ventilation supply fans. The RF Secondary Containment isolation was reset and the normal RF Ventilation system returned to service at 0515 hours, on February 5, 1989.

Actions Taken to Prevent Recurrence:

The apparent design deficiency of RE and RF Ventilation system interaction was reviewed to determine appropriate corrective actions. A modification was considered; however, the following actions to prevent recurrence of this event have been determined to be appropriate:

1) A caution note was added to the RF and RE Ventilation Shutdown procedures stating that the heating coils should be isolated and drained if the system is to be shutdown for an extended period of time (several hours) to prevent an automatic heating steam isolation.

2) Postings have been placed on the RE and RF Ventilation Control Panels repeating the caution added to the shutdown procedures.

A plant modification has been implemented to remove the low temperature trip of the RF Ventilation supply fans and has replaced the installed TCA.

An investigation was conducted to determine the acceptability of increasing the time delay between receipt of the low negative differential pressure signal and isolation of the RF Ventilation

system. We have determined that a change to the LGS Unit 1 and Unit 2 Technical Specifications would be required as this increased time delay could result in an increase in offsite doses, and would require a costly reanalysis of postulated dose rates. The current design is considered adequate and, therefore the increased time delay is not being pursued.

Previous Similar Occurrences:

Limerick Generating Station Unit 1, LER 87-024 reported an isolation of the Refuel Floor Ventilation.

Tracking Code: B - Design Deficiency